

What is claimed is:

1. An information processing system to be accessed through a network, comprising:

5 a plurality of information processors for executing information processing in response to a received packet;

10 a plurality of address translators capable of operating in parallel with each other and being disposed between an external network and an internal network to which said information processors are connected, each of said address translators operating to translate a destination address of a packet received from said external network to an address indicative of one of said information processors to be accessed, and to transfer the address-translated packet to said internal network;

20 means for holding an access correspondence table corresponding to each of said address translators, said access correspondence table having a plurality of control information entries each defining the relation among a source address, an address assigned to an external interface connected to said external network, and a destination address indicative of an information processor to be accessed; and

25 a controller for switching an access route to a

specific information processor from a first route passing through a first address translator to a second route passing through a second address translator,

said controller having means for instructing said

5 second address translator to store received packets for accessing said specific information processor into a memory, instructing said first and second address translators to change address information, which is set to designate packets to be received, in such a manner

10 that the packets for accessing said specific information processor are received by the second address translator in place of said first address translator, shifting a control information entry whose destination address indicates said specific

15 information processor from an access correspondence table corresponding to said first address translator to an access correspondence table corresponding to the second address translator, and notifying said second address translator of end of the route switching, and

20 wherein

said second address translator starts, in response to said notification of end, an operation of translating the destination address of packets stored in said memory in accordance with said access

25 correspondence table corresponding to the second

address translator to transfer the packet to said internal network.

2. The information processing system according to claim 1, wherein said controller composes a part of one of said plurality of information processors.

3. The information processing system according to claim 1, wherein each of control information entries registered in each of said access correspondence tables includes an internal address assigned to an internal interface connected to said internal network in correspondence with an information processor to be accessed, and

each of said address translators translates a destination address and a source address of a packet received from said external network into a destination address and an internal address indicated by one of control information entries in an access correspondence table corresponding to the address translator.

4. The information processing system according to claim 1, wherein each of said address translators has an access correspondence table corresponding thereto,

a copy of each of control information entries in each of said access correspondence tables is stored in one of said information processors corresponding to a destination address defined in the control  
 5 information entry, and

said controller performs said shifting of said control information for switching the access route by using the copy.

10 5. An information processing system to be accessed through a network, comprising:

a plurality of servers for executing information processing according to a received packet;

aplurality of load balancers capable of operating  
 15 in parallel with each other and being disposed between an external network and an internal network to which said servers are connected, each of said load balancers translating at least a destination address of a packet received from said external network to an address  
 20 indicative of one of said servers to be accessed, and transferring the address-translated packet to said internal network;

means for holding an access correspondence table corresponding to each of said load balancers, said  
 25 access correspondence table having a plurality of

control information entries each defining the relation among an address indicative of a packet transmission source, an address assigned to an external interface connected to said external network, and a destination  
5 address indicative of a server to be accessed; and

a controller for switching an access route to a specific server from a first route passing through a first load balancer to a second route passing through a second load balancer,

10 said controller having means for instructing said second load balancer to store received packets for accessing said specific server into a memory, instructing said first and second address translators to change address information, which is set to designate  
15 packets to be received, in such a manner that packets for accessing said specific server are received by the second load balancer in place of said first load balancer, shifting the control information entry whose destination address indicates said specific server  
20 from an access correspondence table to be referred to by said first load balancer to an access correspondence table to be referred to by said second load balancer, and notifying said second load balancer of end of the route switching, and wherein

25 said second load balancer starts, in response to

said notification of end, an operation of translating an address of a packet stored in said memory in accordance with said access correspondence table corresponding to the second load balancer to transfer  
5 the packet to said internal network.

6. A packet processing method in an address translator for translating an address of a packet received from an external network and transferring the  
10 packet to an internal network to which a plurality of information processors are connected, comprising the steps of:

when a control packet for starting an access to one of said information processors is received from  
15 said external network, generating a control information entry indicative of a corresponding relation among an address of a packet transmission source, an address assigned to an external interface which has received said control packet, and a  
20 destination address indicative of one of said information processors to be accessed, and registering the control information entry into an access correspondence table;

when a message indicating that an access route  
25 with respect to an address assigned to said external

interface is being switched is received from a controller connected to said internal network, registering said address in a memory as an address in a transition mode;

5           when a user packet is received from said external network, referring to said access correspondence table and, if a control information entry corresponding to the received packet is registered, translating a destination address of said received packet in  
10 accordance with the control information entry and transferring the address-translated packet to said internal network; and

          when the control information entry corresponding to said received packet is not registered in said access  
15 correspondence table, if the destination address of the received packet is registered as the address in said transition mode, storing the received packet into a memory and, if the destination address of the received packet is not registered as the address in said  
20 transition mode, discarding the received packet.

7.       The packet processing method according to claim 6, further comprising the step of:

          saving the contents of each control information  
25 entry registered in said access correspondence table

into an information processor indicated by a destination address of the entry at a predetermined timing.

5 8. A method of shifting a packet transfer load from  
a first address translator to a second address  
translator, the address translators capable operating  
in parallel with each other and being disposed between  
an external network and an internal network to which  
10 a plurality of information processors are connected,  
each of said address translators translating a  
destination address of a packet received from said  
external network into a destination address indicated  
by an information entry corresponding to the received  
15 packet with reference to a control table having a  
plurality of control information entries each defining  
relations of an address of a packet transmission source,  
an address assigned to an external interface connected  
to said external network, and a destination address  
20 indicative of an information processor to be accessed,  
and transferring the packet to said internal network,

the method comprising the steps of:

operating said second address translator in an  
operation mode for storing received packets to be  
25 transferred to a specific information processor in the



translator without transferring the received packets to said internal network;

changing address information set in said first and second address translators for designating packets to be received, so that packets for accessing said specific information processor are received by said second address translator in place of said first address translator;

shifting a control information entry whose destination address indicates said specific information processor from the control table referred to by said first address translator to the control table referred to by said second address translator; and

operating said second address translator in an operation mode for translating the address of each of said stored packets and a packet received thereafter which should be transferred to said specific information processor in accordance with said control table and transferring the address-translated packet to the internal network.

9. A method of shifting a packet transfer load according to claim 8, wherein each of said address translators has said control table to be referred to, and the method further comprises the steps of:

storing in each of said information processors a copy of information entries each including an address of the information processor as a destination address; and

5           shifting the control information entry held by said specific information processor to a control table to be referred to by said second address translator.

10. A program executed by a computer to control a  
 10 packet transfer load in a plurality of address translators disposed between an external network and an internal network to which a plurality of information processors are connected, each of said address translators translating a destination address of a  
 15 packet received from said external network to a destination address indicated by an information entry corresponding to the received packet with reference to a control table having a plurality of information entries each defining the relations among an address  
 20 of a packet transmission source, an address assigned to an external interface connected to said external network, and a destination address indicative of one of said information processors to be accessed, and transferring the packet to said internal network,

25           said program making the computer perform:

a step of specifying an information processor for which switching of an access route from a first route passing through a first address translator to a second route passing through a second address translator is required;

a step of instructing said second address translator to shift into an operation mode for temporarily storing a received packet to be transferred to said specified information processor in the translator without transferring the received packet to said internal network;

a step of instructing said first and second address translators to change address information, which is set to designate packets to be received, so that packets to be transferred to said specific information processor are received by said second address translator in place of said first address translator;

a step of shifting the control information entry whose destination address indicates said specified information processor from a control table referred to by said first address translator to a control table referred to by said second address translator; and

a step of instructing said second address translator to operate in an operation mode for translating the address of each of said stored packets

and a packet received thereafter which should be transferred to said specified information processor, with reference to said control table and transferring the packet to said internal network.

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